

## FACTS ABOUT

# Truck and Bus Regulation Emissions Reductions and Health Benefits

*New rules to achieve significant emission reductions and protect public health*

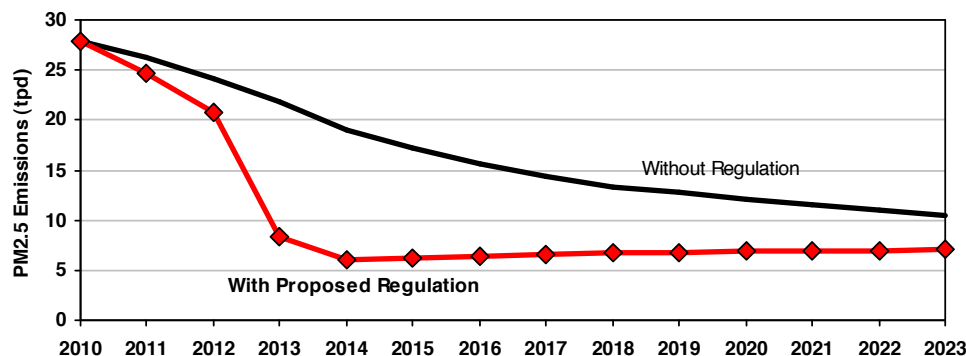
On December 12, 2008, the California Air Resources Board (ARB) approved a new regulation to significantly reduce emissions from existing on-road diesel vehicles operating in California. The regulation requires affected trucks and buses to meet performance requirements between 2011 and 2023. By January 1, 2023, all vehicles must have a 2010 model year engine or equivalent. For general information about the regulation, see Truck and Bus Regulation General Overview. This fact sheet discusses the estimated emissions benefits and associated health benefits of the regulation.

## What are the expected emission benefits of the regulation?

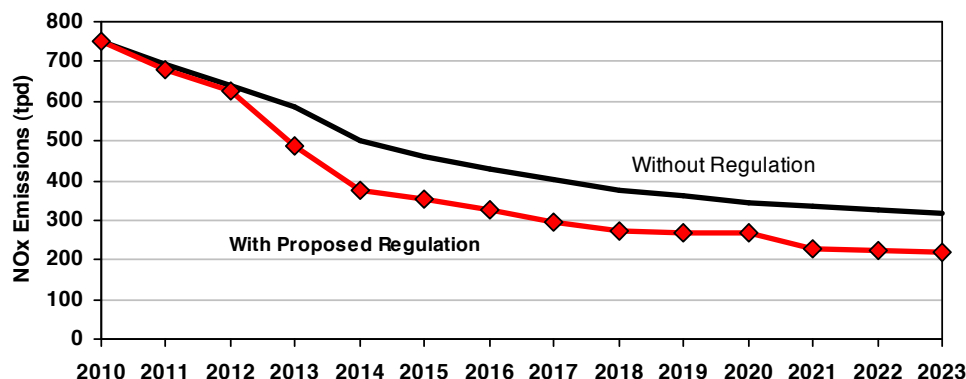
In 1998, the ARB identified diesel particulate matter, commonly referred to as PM, as a toxic air contaminant. In 2000, the ARB approved a comprehensive plan, the Diesel Risk Reduction Plan or Diesel RRP, to reduce public's risk exposure to diesel PM by 80 percent by 2020 from 2000 levels. The proposed regulation will significantly reduce diesel PM emissions from trucks, providing an 80 percent reduction in 2020 from 2000 levels. While this falls somewhat short of the 2020 goal of reducing diesel PM by 85 percent from 2000 baseline levels, it represents the maximum achievable reductions of diesel PM emissions from existing trucks and buses.

The regulation will also provide significant near-term and long-term reductions in oxides of nitrogen (NOx) emissions from trucks and buses, which contribute to elevated smog levels throughout the state. The projected NOx emissions reductions from the regulation are 124 tons per day (tpd) and 98 tpd in 2014 and 2023, respectively. Figures 1 and 2 below illustrate the difference in PM and NOx emission levels with and without the regulation.

**Figure 1: Statewide PM emissions inventory in tons per day (tpd)**



**Figure 2: Statewide NOx emissions inventory in tons per day (tpd)**



## **What health benefits will the regulation achieve?**

These emission reductions will result in lower ambient PM<sub>2.5</sub> levels and reduced exposure to diesel PM. Staff estimates that statewide, approximately 9,400 premature deaths statewide would be avoided by the year 2025 from the implementation of the regulation<sup>1</sup>. Estimates of other health effects avoided statewide include:

- 1,000 hospital admissions due to respiratory causes
- 2,000 hospital admissions to cardiovascular causes
- 150,000 cases of asthma-related and other lower respiratory symptoms
- 12,000 cases of acute bronchitis
- 950,000 work loss days
- 5,500,000 minor restricted activity days

These health benefits will in turn result in economic benefits due to savings from avoided deaths and in health care costs. Staff estimates the economic benefits to be between \$48 and \$69 billion, depending on the discount rate used.

## **How can we put the expected health benefits in context?**

Over its course, the regulation is expected to prevent about 9,400 deaths, which is roughly twice the number of people killed by car accidents or by secondhand smoke in California each year. Secondhand smoke is estimated to cause about 4,000 premature deaths per year in California (ARB, 2006), while motor vehicle accidents killed 4,236 people in California in 2006 (NCSA, 2007).

## **How were the health benefits estimated?**

Staff utilized three sets of data to determine the estimated health benefits. The first set of data had air basin specific estimates of emissions of directly emitted diesel PM and NO<sub>x</sub>, which lead to the formation in the atmosphere of nitrate particles. Staff also had estimates of the ambient particulate matter concentrations in each air basin. Finally, there were epidemiological studies linking ambient levels of particulate matter to various health effects, including premature death. Using these three data sets, staff developed relationships between tons of emission reductions, the corresponding expected decrease in ambient particulate matter levels, and finally, the expected avoided health impacts.

## **Where can I find more information about the regulation?**

Fact sheets, compliance tools, and regulatory documents are available at [www.arb.ca.gov/dieseltruck](http://www.arb.ca.gov/dieseltruck) or by calling the ARB's diesel hotline at (866) 6DIESEL (634-3735). You may also obtain this document in an alternative format by contacting ARB at: (916) 322-4505 (voice); (916) 324-9531 (TDD, Sacramento area only); or (800) 700-8326 (TDD, outside Sacramento). TTY/TDD/Speech-to-Speech users may dial 711 for the California Relay Service.

### **Notes**

1. Emissions from vehicles covered by the regulation currently cause 4,500 deaths per year, but this annual impact is dropping over time as the fleet normally turns over to new, cleaner vehicles.

### **References**

ARB, 2006b. California Air Resources Board. Environmental Tobacco Smoke: A Toxic Air Contaminant. October 18, 2006. <http://ftp.arb.ca.gov/carbis/regact/ets2006/isor.pdf>

NCSA, 2007. National Center for Statistics and Analysis. 2006 Traffic Safety Annual Assessment – A Preview. July 2007. <http://www.nrd.nhtsa.dot.gov/pubs/810791.pdf>